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ABSTRACT

An ethnographic study examined a distinctive and recurrent form of problem solving interaction that has been previously unreported in the organizational communication and problem solving literatures--Informal Problem Solving Meetings (IPSs). The fact that participants in IPS meetings themselves neither name or ordinarily formulate Informal Problem Solving or Informal Problem Solving meetings is an aspect of these phenomena's elusiveness and is a distinctive and consequential feature. Conversations at a high-technology firm were collected and transcribed, participant observations were recorded in field notes, and interviews were conducted. Results indicated that Informal Problem Solving at this site occurs against a backdrop of frequent meetings of many different kinds in a setting in which many of the staff were trained in formally instituted problem solving methods used in formally scheduled and planned meetings. Results also indicated that (1) the meetings were ad hoc gatherings; (2) the internal organization of the IPS meetings contrasted with that of standard formal meetings; (3) IPS meetings were intrinsically located within the encompassing organization; and (4) features of IPS meetings contrast with those of formal meetings and "grapevine talk." (Contains 41 references and 17 notes.) (RS)

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Ad Hoc Gatherings for Informal Problem Solving: Ordinary Conversation with Co-Workers as Labor for the Company

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Ad Hoc Gatherings for Informal Problem Solving

The Problem and Topic

Over the course of conducting exploratory ethnographic fieldwork on the variety of meetings held in high-tech business organizations, we[1] found a distinctive and recurrent form of problem solving interaction that has been previously unreported in the organizational communication and problem solving literatures. As we will point out in our description and analysis of this form of problem solving interaction, however, there are resonant patterns and remote relatives that have been glimpsed, noted, and mentioned but not described in recent writings on organizational communication and problem solving (e.g. Frey, 1996; Hirokawa & Salazar, 1997; Lammers & Krikorian 1997; Poole and Hirokawa, 1986; Putnam, 1996; Putnam & Stohl, 1990, 1996; Seibold, 1979; Seibold and Krikorian, 1997; Sinclair-James, and Stohl, 1997). The Informal Problem Solving Meetings that we report here are but one kind among many. We propose that Informal Problem Solving Meetings, their relatives as noted by other researchers, formal meetings of various sorts, grapevine encounters, huddles, and other gatherings that we have neither heard of nor imagined, make up an array of focused gatherings within organizations. This array of purely communicational units encompasses the entire range of unmediated interactional encounters that compose the communicative life of an organization. The composition and arrangement of this array of basic communicational units is

investigatable as a topic in the ethnography of communication, and our current investigation can be understood as a phase of that project.

Because the participants themselves neither name nor ordinarily formulate[2] this elusive, distinctive, and recurrent oriented-to-by-participants form of interaction, we have come to call it Informal Problem Solving (IPS) and the ad hoc gatherings in which it occurs IPS Meetings.[3] The fact that the participants in IPS Meetings themselves neither name nor ordinarily formulate Informal Problem Solving or Informal Problem Solving Meetings is an aspect of these phenomena's elusiveness and is a distinctive and consequential feature. On the one hand, it is an aspect of the observability of Informal Problem Solving and Informal Problem Solving Meetings that makes them open to discovery and observation through some social science methods while escaping the reach of others.[4] On the other hand, and more to the point of our interests, this feature is also telling for the status of Informal Problem Solving and Informal Problem Solving Meetings as real things, as cultural things that organizational members could be said to really do and really mutually orient to.

> The findability, locatability, identifiability, [etc.] of attended-to or oriented-to cultural things is thematized in ethnomethodology's unique adequacy requirement of methods (Garfinkel and Wieder, 1992), a policy that provides a direction

for our investigation.

> A phenomenon of order* [such as IPS and IPS Meetings] is available in the lived in-courseness of its local production and natural accountability....[In accordance with ethnomethodology's unique adequacy requirement of methods, the analyst must be], with others, in a concerted competence of methods with which to recognize, identify, follow, display, and describe phenomena of order* in local productions of coherent detail. These methods are uniquely possessed in, and as of, the object's [, e.g., the IPS's,] endogenous local production and natural accountability...
>
> Just in any actual case, a phenomenon of order* already possesses whatever, as methods, methods could be of finding it if methods for finding it are [the methods] at issue. (p. 182)[5]

Garfinkel and Wieder (1992, p. 182) illustrate an object's being in possession of its methods, being in those methods, and being possessed by its methods (where methods of location, recognition, identification, and so forth are the methods of interest) by considering the task of finding any conversation at a cocktail party. Any conversation that can be located at the cocktail party will already be possessed of whatever methods are needed for finding just that conversation. Any adequate finding of just that single conversation (and this includes finding the

same conversation that others find) would have to be competently engaged with precisely those methods that are already possessed by just that conversation.

The participants' (and the researchers') skills, knowledge, competence in and with Informal Problem Solving, as an ongoing part of organizational life in some particular setting, makes Informal Problem Solving a possible observable thing for the participants (and for the researcher): That competence (in being possessed in, by, and of, the IPS's endogenous local production[6]) is what Informal Problem Solving is.[7]

A Rehearsal of Our Argument

Our aim is to identify, describe, analyze and display what Informal Problem Solving and Informal Problem Solving Meetings are as oriented-to cultural things, what they look like as phenomena, what they consist of as an organized ensemble of constituents, aspects, and appearances, and how they are located within a larger encompassing concatenation of activities such as those composing a plant, firm, or bureaucracy. Our questions, thereby, concern what, with others, one must know and do to be in the "specifically unremarkable presence" of any particular instance of Informal Problem Solving, an articulation of the "concerted competence of methods" whose use permits the finding, identifying, and describing (etc.) of Informal Problem Solving and Informal Problem Solving Meetings.

In order to describe what Informal Problem Solving and Informal Problem Solving Meetings are, what they look like, what they consist of, and how these elusive things are located, we attend to the technical particulars of what a researcher[8] must know and do to find, identify, and describe Informal Problem Solving and Informal Problem Solving Meetings: Finding and identifying these particulars requires that the researcher be in the place where the interaction happens at the time that it happens; they require that the researcher be alert for the possibility of an incipient gathering; they require that the researcher competently recognize the portents, signs, or indicators that an IPS meeting is being assembled and initiated; they require that the researcher be competent enough in the delicacies of interpersonal transactions in this place to smoothly place herself or himself in the interaction[9] ,both physically and interactionally, as a mostly silent but nonetheless included party who has a proper interest in the goings-on; they require that the researcher be sufficiently competent in the official work of the organization that the researcher can see, just as the native participants can see, the relevance of the talk in a developing gathering (an incipient IPS Meeting) to the official work tasks of the participants; they require that the researcher be sufficiently knowledgeable about who knows what, and who has official authority to act on what, that the researcher can see that an apparent IPS meeting is

properly staffed, and they require more. Our initial task is to display and illuminate these particulars through a brief ethnography of the features and ecology[10] of Informal Problem Solving and through an examination of it that contrasts it with the similarly informal grapevine talk and the more formal quality circles.

Method and Background

We conducted ethnographic fieldwork in high-tech business organizations at several industrial plants near the Oklahoma-Texas border. The preponderance of our observations were conducted at a high-technology manufacturing firm that we will call Integrated Technologies (IT). IT employs sophisticated computer software in the manufacturing of its products, and that fact is an omni-relevant topic, vehicle, and condition of communication of many sorts throughout IT's facilities.[11] We focused our attention on the phenomena of naturally occurring Informal Problem Solving and Informal Problem Solving meetings and their features, on their location within the ensemble of related activities making up a high tech industrial plant, and on their distribution in space and time and their juxtaposition to other events. We collected and transcribed audio tape recorded conversations, made participant observations that were recorded in field notes, and conducted ethnographic interviews that were sometimes tape recorded.[12]

We found that Informal Problem Solving in this site occurs against a backdrop of frequent meetings of many different kinds (e.g., shift-change "pass-down" meetings, production-scheduling meetings, quality circle meetings, etc.), in a setting in which many of the staff were trained in formally instituted problem solving methods, these methods being used in formally scheduled and planned meetings. At Integrated Technologies, the source of most of the examples in this paper, in-house training in problem solving (primarily for use in scheduled meetings) was arranged by an in-house trainer. Integrated Technology's personnel, then, are experienced at participating in formal problem solving along lines consistent with procedures described, advocated, and often developed by social scientists.

An Ethnographic Description of Some Primary Features of Informal Problem Solving, Its Organization, and Its Habitat

IPS Meetings are Ad Hoc Gatherings

Although it is observable about IPS meetings that they are ad hoc and that they are gatherings, these features also play a part in the very definition of Informal Problem Solving Meetings. Like certain observable features of everyday ordinary conversation in Sacks, Schegloff, and Jefferson's (1978) classic analysis, such as the absence of pre-allocated turns, a transformation of IPS Meeting that removed its ad-hoc-ness would make it some sort of formal meeting, whereas making it a non-gathering would make it no meeting at all.

1. An IPS Meeting is assembled when one or more workers face an immediate problem that encourages them to seek out a small number of colleagues for brief, ad hoc, impromptu discussions and group consultations. When we ask them to formulate these meetings, workers explain to us that they often turn to their colleagues for help without thinking about it and that they typically do not speak of or think of their act of turning to others as issuing a call for a meeting, nor do they think of what they do in a discussion as engaging in problem solving.

2. While the participants in an IPS Meeting may be members of a continuing work team, department, or sub-unit within a department, they need not be (and often are not) drawn from the

same work group. While a particular ensemble of persons can be members of a small group and also participants in the same gathering in Goffman's (1963) sense, the order[13] of an Informal Planning Meeting, is the order of a gathering and not that of a group in the sense meant by small group researchers. Although it is immensely consequential that what makes an IPS Meeting an IPS Meeting is its character as a focused gathering and not a small group, we do not fully develop this point here. Instead, we simply point out that the concepts of gathering and small group are not logical alternatives, but rather are drawn from two different cross cutting ensembles of concepts: The concept of small group (as defined by such well known classic and contemporary sources as Sherif and Sherif, 1953; Cragan and Wright, 1991; Propp and Kreps, 1994; Cathcart, Samovar, and Henman, 1996; and Socha, 1997) entails the participation of a small number of persons with common goals and norms interacting face-to-face over time, while the concept of gathering is framed in terms of mutual recognition and mutually monitorable co-presence (see Goffman, 1963, especially pp. 18-24, and 1983).

As is the case with other kinds of gatherings, Informal Problem Solving Meetings are visible as achieved mutual recognitions in arrangements of mutually monitorable co-presence, the visibility of these aspects making it possible for us (as analytic observers) to recognize a meeting in progress, a meeting

in the making, a meeting on the verge of termination, and so forth. Just as these features make an IPS Meeting recognizable and findable for the participants, they do so for us as well (cf. Sacks, Schegloff, and Jefferson, 1978; Heritage and Atkinson, 1984; and Zimmerman, 1988).

The difference between groups and gatherings makes it difficult to place our findings into a definite relationship with writings in the small group literature. This difference may also explain why, with the noticeable exceptions of Atkinson, Cuff, and Lee (1978), Boden (1984, 1994), Browne (1981), Hartsell (1994), Larrue and Trognon (1993), [Author 1] (1996a, 1996b, 1997), Paap and Hanson (1982), [Author 2] (1996a, 1996b), there is virtually no descriptive literature[14] on the vast variety of naturally occurring meetings.

3. The attention of participants in these unnamed and ordinarily unplanned sessions is focused on solving some particular problem(s) of the organization that occasioned the IPS Meeting in the first place. Other topics may emerge in these gatherings, but priority is given to the problem that stands in need of resolution. This priority is highlighted in the way that IPS Meetings are assembled and initiated.

4. An IPS Meeting is not called in advance, but is assembled just as it is needed in response to a problem requiring immediate attention before one worker can continue with a particular task.

Thus IPS Meetings do not occur at regular intervals as is the case with daily or weekly meetings. Participants neither receive warning that one of these meetings will happen nor is the anticipated length of these meetings known in advance. IPS Meetings are assembled now or "in just a minute" when "I'll be coming by" or "you come here." The arrangement may be made by phoning ahead, leaving voice mail, or by just dropping by.

5. In yet another contrast to typical formal meetings, the composition of IPS Meetings is also ad hoc. Those who call the meeting select co-workers whose participation is expected to directly contribute to the apparent problem's resolution and those co-workers whose cooperation must be enlisted because of the range of their occupational duties and authority. This feature of the method of assembling IPS Meetings has the consequence of restricting participation in a specific IPS Meeting to those whose knowledge about some aspect of the meeting's occasioning problem is apt to contribute to its resolution. Sometimes an invitation is extended solely on the grounds of the invitee's special knowledge, but ordinarily participants are also able to do something about the problem, and ordinarily they have the authority to do something about the problem.

6. IPS Meetings happen "on the spot." During IPS Meetings, workers often collect in what Merrell (1979) calls a "huddle formation." At IT, we found that workers collect in these huddle-

form gatherings near someone's desk, in hallways, in aisleways, or around computer terminals to address a job-relevant problem. This contrasts with the procedures employed for the assembly of a formal meeting, which includes convening it in a special location such as a conference room. The size, shape, and furnishings of IT cubicles encourage and facilitate "on the spot" IPS Meetings, whereas the architecture of some other organizational offices do not (see points 4 and 5 of the section on IPS Meeting's intrinsic locatedness below for a treatment of selected aspects of office ecology).

The specific meeting place, although important in the ways that it facilitates or inhibits interaction, is relatively unimportant as signifying, representing, or simply indicating that "this is a place for meetings and, therefore, this interaction is official." A data specialist at Integrated Technologies described IPS Meetings in this way in the following informant-based interview:

> We always keep in touch with each other and say did you find out any information. We don't call a meeting. We just go to their desk and say did you find out such and such.

In another informant-based interview at a tire plant, a machinist describes how some particular location is an important part of formal meetings, in contrast to the relative lack of importance of location to IPS Meetings that happen on the spot.

> We got ICS meetings ((a kind of formal meeting)) every once in a while. We get in there with our supervisors and a scheduler. The scheduler schedules all of the machines and what we are supposed to run. And we are all there. Like 20 of us and we all go into a room.

The machinist also elaborated the contrast between informal and formal meetings:

> I talk to everybody all the time. But that's just because people are walking by. We're close to an aisle and people drive by (golf carts, bicycles) or walk by. Cause they're like supervisors. They got to go to their uh production meetings every two hours. They áll got to go into a room.

The Internal Organization of IPS Meetings Contrasts with That of Standard Formal Meetings

Fundamentally, an IPS Meeting is a specifically focused everyday conversation, with relatively carefully selected participants. Its internal organization is that of the structure of an everyday conversation that has been channeled into a rather narrow on-task[15] course.

1. Every worker in the organization (from operators on production lines, to engineers in administration areas, to plant managers and supervisors) may participate in impromptu, task-oriented IPS Meetings. The sort of cultural object that an IPS Meetings is, and the speaking situations that it provides, mutes

the differences between the participants in the authority they might exercise in the organizational chain of command.

The locally managed, party administered, interactionally controlled conversational turn taking system of everyday, mundane conversation, first described by Sacks, Schegloff, and Jefferson (1978, especially pp. 40-43), has a (resistible) bias toward an equality of participation in the conduct of IPS Meetings: The turn-taking system of ordinary conversation tends toward maximizing the opportunities for all parties to participate and tends toward maximizing the number of possible entry points into the flow of turns in such a way that entry may be effected at just that point where either current speaker or aspiring prospective speaker senses that prospective speaker's potential contribution would be particularly relevant. A turn-taking system that allocated turns on the basis of rank or certain pre-arrangements would tend to impede or inhibit this relative equality of access.

Furthermore, within the local culture(s) of IPS Meetings that we observed, particular ways of speaking were valued: It was understood that it was appropriate to treat Informal Problem Solving colleagues in an egalitarian fashion, analogous to the ideal treatment that a community of scholars or scientists accord to one another. An Informal Problem Solving participant who treats other participants in an overbearing manner is subject to their criticism when outside their presence. Participants

complain that an overbearing or expansive way of speaking impedes the collaborative and conversational style of interaction characteristic of IPS Meetings and that persons who interact in these ways use up more time than is typically given to IPS Meetings. Although one participant might seem dominant in a particular IPS Meeting, in that he or she takes many turns or some extended turns, such an allocation is proper if it is commensurate with that worker's expertise or special knowledge and is not based on the worker's status or position. The complaints of participants also disclose their sensitivity to shifts in the focus of the meeting from efforts to accomplish some steps of problem solving (e.g., analyzing the problem, gathering background information, or searching for alternatives) to a focus on achieving other personal or organizational goals such as those sought in formal meetings, e.g. self- aggrandizement, status seeking, defeating one's enemies, carrying out reprimands, voicing grievances, instructing subordinates, and so forth.

2. Workers collaborate with each other in IPS Meetings in a variety of ways: Workers may ask a co-worker, superior, or subordinate for information or opinions in order for the worker to make a decision or complete a task. Workers may seek confirmation or reinforcement from others about a doubtful decision. A worker may simply seek the company of other participants to talk through problems in order to clarify and reflect on his or her own ideas.

3. In a number of different respects, IPS Meetings are directly on-task with characteristically little space left over for sociable interaction. In this vein, a candidate-problem for Informal Problem Solving attention has the appearance of an issue deliberately brought to the conversation. Informal Problem Solving topics also seem to come out of the blue. A worker only needs to suddenly drop in on the cubical (cube) of others and ask a question about an organizationally relevant matter that stands in need of resolution and Informal Problem Solving is underway. This means of combined topic initiation and encounter initiation or refocussing provides that--unlike the case with gossip, simple socializing, and grapevine talk--Informal Problem Solving talk has no evident connection to already established topics of conversation within the gathering that are under discussion prior to the problem's introduction, should such topics exist. It does, however, require steps to get it started and does have structural relations to ongoing talk (see [Author 1], 1996a).

Typically, IPS Meetings are brief, and initiation and termination are brief: Greeting exchanges are not elaborate, pre-business sociable talk is avoided, and the gathering does not stay focused very long after a resolution or its temporary substitute (e.g. a decision to defer) is reached. An IPS Meeting characteristically has no collection of agenda items, only the initiating problem.

IPS Meetings Are Intrinsically Located within the Encompassing Organization

IPS Meetings are located within a larger encompassing concatenation of boundary crossing exchanges, surrounded by contemporaneous, preceding, and following activities, and located within a physical environment that is partially designed to shape, impede, and encourage particular types of interactions.

1. The tight focus of IPS Meetings occurs against a backdrop of competing messages--messages that paradoxically may become part of the problem or its solution. Unlike formal meetings and certain classes of meetings with executives whose inbound communication is guarded and screened by assistants, IPS Meetings are often punctuated by the receipt of e-mail, faxes, and computer print-outs as well as by phone calls. These externally initiated messages are dealt with in the midst of an ongoing IPS Meeting in ways that the participants find to be proper and not distracting.

2. Computers also play other part in IPS meetings. In high tech organizations, IPS Meetings are often structured around (and sometimes are set off by problems in) information displayed on a computer screen that the assembled participants examine together. Some participants offer commentary about the computer's display, and that may include responses to inquiries from the participants. In some respects, the computer functions as another participant.

3. One of the ways that IPS Meetings are located within a larger encompassing concatenation of activities is through their sequential proximity to formal meetings that precede or follow them: In this way, IPS Meetings and formal meetings are a matter of reciprocal context, each potentially providing thematically relevant context for the other.[16] An IPS Meeting may have a visible surface connection to a formal meeting that precedes or follows it. Although many IPS Meetings have no visible connection to a larger formal meeting, some IPS Meetings provide the seed for ideas that are to be discussed and expanded later in formal meetings held in conference rooms. An IPS Meeting's problem may be of such a sort that it concerns only those few that are immediately involved in it, and they, therefore, become the meeting's participants: In such cases, the problem's resolution does not require input or agreement from others. On the other hand, the meeting may result in ideas or proposals that do require the approval, consent, or notification of others in the organization who possess more or different authority than any of the meeting's participants. We have heard participants say such things as, "That sounds like a good idea. Who else do we need to get involved in this?" or "Hey, that's a good idea, let's take it to the manager." Still other IPS Meetings are held in response to, or as a follow-up to, information presented earlier in a formal meeting.

4. Another important condition for carrying out the work of an organization is the ecology of interaction that promotes the emergence of IPS, is a condition of collaboration within IPS, and is a facility for IPS. In general terms, the spatio-temporal ecological features of interaction are conditions of co-presence (the conditions that control who can be co-present with whom).[17] Some organized arrangements of space, like those at Integrated Technologies, promote and encourage Informal Problem Solving through office layouts that facilitate immediate verbal and nonverbal feedback. Workers at Integrated Technologies do not sit in offices with four walls, a ceiling, and closed doors. Instead, workers sit in cubicles with partitions about five feet high that have no ceilings or doors. Workers may lean over the top of a partition to ask co-workers about problems. There are times when they simply sit at their desks and shout to someone in the next cubicle about an organizational issue. These informal moments may take place with all participants inside one person's cubicle or with only some of the participants inside the cubicle and the others standing nearby in the hallway, doorway, or another cubicle.

5. In addition to controlling co-presence, the spatio-temporal ecolological features of interaction may also function as the conditions of the directness of access to the object topically represented in interaction: What the participants are attending to

and talking about may be immediately present, accessible only through boosting devices, or accessible only through piecemeal inferences and interpretations in accounts about it. At Integrated Technologies, the ways that workers may be separated from the problem source (the object of their problem solving activities) and the ways that workers may be separated from some fellow workers while being thrown together with others is an important condition of and for IPS Meetings. In that plant, just who can interact with whom, and who can observe what, is importantly controlled by the segregation imposed by the uses of clean rooms and the requirement that one "smock up" if one is to enter them. Because participants are rarely able to witness the actual event(s) forming the problem or observe details of a problem, they must interact with each other in IPS Meetings to piece together the bits of known facts from a variety of sources, including information stored in the computer documentation system.

One set of typical problem solving situations at Integrated Technologies involves workers from administrative areas of the plant (such as engineers, statisticians, and systems analysts) piecing together a picture of what operators on production lines in the clean environment are doing. Unless major problems occur, engineers do not go into the clean environment because of the difficulty of having to "smock-up" in special clothing (e.g. jumpsuit, head dressing, booties, safety glasses). Similarly

operators resist leaving the clean environment because of the need to undress and re-dress in the protective clothing. Therefore, when engineers need to analyze a problem created by operators, they usually do not make actual field observations of it, but attempt to make sense of production problems indirectly by communicating with other engineers and by using information stored in the computer system.

Although operators on production lines may have a "hands-on" capability of working directly with the product or equipment, thus having visual or tactile contact with the problem source, they are often unable to observe or witness the actual problem. For example, operators cannot observe the intricate details of how a large machine might be defective. Neither are they able to actually witness human error. Problems are typically recognized after someone notices a variation from the norm, not during the moment that the problem actually occurs. Therefore, instead of having the ability to observe directly, operators in the field must also socially construct interpretations of the problem in much the same way that engineers in offices do. This means they rely on various indirect sources of information such as what co-workers know and what can be accessed through computers.

Contrastive Features of IPS Meetings, Formal Meetings, and Grapevine Talk

Some authors, e.g., Seibold and Krikorian (1997), locate problem solving as an activity of formal meetings and characterize informal meetings strictly in terms of sociability. While participants in formal meetings "deal with some task--typically a problem that has to be solved or a decision that has to be made that serves as the group's primary reason for being" (p. 272), participants in informal meetings are portrayed as encouraging each other to communicate a variety of feelings, particularly those feelings that are associated with socio-emotional leadership as that has been analyzed over the past 50 years in the study of small groups.

IPS Meetings appear to share some properties with other informal social gatherings, especially in regard to those issues of organization initially located by Sacks, Schegloff, and Jefferson (1978), such as issues that bear on turn-allocation, rules governing procedures for selecting next speaker, whether or not there are procedures for restricting turn content or determining turn size, procedures for restricting deliberation or conversation length, and the like: IPS Meetings also share some properties of formal meetings in that they are understood by participants to be conducted in the interests of achieving the organization's goals. A prominent feature of the IPS Meetings

that we observed is that in them, workers deliberately do the business of the organization and consider themselves to be on the organization's time.

Informal Problem Solving Meetings Contrasted With Formal Meetings. Several definitive features of IPS Meetings distinguish them from formal meetings. One such feature involves participants' use of the ordinary conversational speech exchange system. According to Atkinson (1982), participants in formal settings rely on particular features of talk noticeably different from the details of conversation in informal settings. For example, "the frequency and length of pauses within turns, gaps between turns, and the relative absence of hesitations, hitches, self-corrections, and repair initiations" differ in these types of interactional situations (Atkinson, 1982, p. 92). Other differences concern the length of speaker turns. In formal meetings, a speaker is apt to assemble a long segment of talk, but in informal meetings, turns tend to be relatively short with speakers jointly completing sentences to collaboratively formulate answers to questions about, or assessments of, the situation. In informal talk, neither turn order nor turn size is fixed, but varies with options allowing for different next speakers and a range of turns that may be constructed (Sacks, Schegloff, and Jefferson, 1978).

The following data segment from Integrated Technologies displays the typical features of conversational turn-taking in IPS Meetings. In this IPS Meeting, three engineers (Kirk, Clint, and Lonnie) try to reconstruct the details of a problem created the night before by night shift operators. They have assembled in a face-to-face huddle that includes a computer's screen.

Excerpt 1

T1 L: What's the difference ( )?

T2 K: It showed how many wafers they put off (up there)

T3 C: each hour?

T4 K: no, (.) well (.) or,- or just- just how many wafers they put off (.) of that machine=

T5 C: =oh okay

T6 K: they had that- they had that up there but

T7 C: it was (eleven)

T8 K: it was eleve:::n (.)
and the most he could get off this was a hundred and twenty one wafers. (.)
and that's if he's running full runs or templates
we know uh that (.) didn't happen (.)
we know that didn't happen all the way through here

T9 C: okay

T10 K: here they could had: (.) two hours or so (.) and (.) and- and of course they had fourteen- fourteen hours on on this one, (.)

T11 C: um hum

T12 K: (.) on this one they had:

T13 C: just say three

T14 K: three hours: here (.) and a hour- four hours

T15 C: hum

T16 K: exactly

T17 C: three hou=

T18 K: =about three and one half hours

T19 C: uh hum (.) say that's about four (.) four to five

T20 K: yeah

T21 C: four I'll say four

T22 K: yeah four hours here

In this conversation, speaker change occurs frequently, and even the more extended turns do not approach the length of extended turns found in formal meetings (see T8 and T10). Lonnie begins this episode by asking a question that is jointly answered by Clint and Kirk as they collaboratively construct a single answer through a series of alternating turns in which they often complete each others' utterances (as they do in turns 2-3; 6-7; 12-13; 17-18; and 21-22). Most of the turns in this conversation

are relatively short, consisting of one phrase or word. In turns T7 and T8, Clint and Kirk speak in overlap, with each speaking the same words and completing (the same) sentence simultaneously. They also repair turns when they need to re-formulate a thought, for example, Kirk states: "no (.) well (.) or- or just- just how many wafers they put off (.) of that machine." Also, pauses within turns occur; for example, Clint utters: "uh hum (.) say that's about four (.) four to five." In turns T9, T11, T15, and T20, participants offer immediate feedback (not commonly found in formal meetings), signaling their attention and understanding to co-participants. The features of excerpt 1 (above) and excerpt 2 (a formal meeting, below) fit precisely with the contrast between those of formal meetings and ordinary conversation as depicted by Sacks, Schegloff, and Jefferson (1978) and Atkinson (1982).

In contrast to IPS Meetings, formal meetings observed at Integrated Technologies do not employ ordinary conversational turn-taking. The following data segment from a Quality Circle (QC) meeting at Integrated Technologies displays a speech exchange system different from the system found in IPS Meetings.

Excerpt 2

D: Well it looks like the first thing on the agenda is to welcome our visitor and we do have one other team member apparently she is going to be a little late today, Shelly D. The second thing is to

review our code of conduct which basically just reminds us all how we're suppose to act in here. That doesn't mean that's the way we do act. Uhm basically there is no verbal harassment of ideas. Suppose to be on time. Refreshments are allowed so if you like you can step out and get a drink or something to eat. Suppose to stay on the subject. Don't intentionally interrupt another speaker. Notify the team leader or assistant leader if you can't attend that day. What is said stays in here so you are not allowed to take the tape with you. Suppose to have fun ((flipping through charts)). If you're sick or have a ( ) day there's no ( ) meeting. All QC activities will be conducted on Integrated Technologies' time and if the majority is not present after the first 15 minutes we're going to be dismissed. I think we've already met the majority and that's the end of our code of conduct. There's Shelly.

S: I apologize for being late.

D: Okay well we basically went through the first two items on our agenda which was to welcome our visitor and so we're going to read the minutes from last week (.) Would you like to do that Kim?

K: Sure I'll do it.

Unlike the informal meeting in excerpt 1, which happened on the spur of the moment in reaction to information that had been presented in an earlier formal meeting, excerpt 2 involves a QC team that meets on a regular, pre-scheduled basis. Membership remains the same for one year, and it has a designated leader selected by the group. This particular QC team has four members. Rules of conduct and minutes are read at each meeting. Formulations and explications are common as the participants formulate, specify, and articulate what we are doing now, what we just did, and what we are about to do (Cf. [Author 2] 1996b).

Often, the training and development director of self-directed work teams participates in these meetings to monitor the group's performance and to serve as a resource. Although QC meetings are thought to be an alternative to formal interactions, we have found them to be an intermediate form which partakes of some features of both formal and informal meetings. Although participants are not constrained by the conventionally prescribed rules and procedures that characterize formal meetings, their turn-taking does not have the quality of everyday conversation that we find in IPS Meetings.

Informal Problem Solving Contrasted With Grapevine Talk. An informal communication form that is described and analyzed in the communication literature is often referred to there as grapevine talk (Davis, 1953; Farace, Monge, & Russell, 1977, Merrell 1979,

Hellweg, 1992, Goldhaber, 1993). Like Informal Problem Solving, Grapevine talk is job related but (and in a somewhat different fashion than IPS) is unofficial and unauthorized. The literature illustrates grapevine talk with examples such as exchanging rumors about the boss, passing unauthorized reports within the firm, and semi-secret discussions of a variety of other off-the- record organizational happenings. It bears a similarity to some conceptions of gossip. We indirectly learn from organizational communication researchers and more directly from our own observations that an important feature of grapevine talk is that employees understand that engaging in grapevine talk is not part of their job. The work or tasks of the firm or other organization are not (at least directly) moved forward by engaging in grapevine talk. By way of contrast, employees do understand that Informal Problem Solving is "company work."

Nonetheless, on occasion, grapevine talk may occur as the momentary focus of an IPS Meeting. For example, when workers involved in work-related business have to wait for information to come up from the computer system or from other sources, they may have free time to become side-tracked in unofficial talk. In addition, at Integrated Technologies, we found instances of grapevine talk standing alone, without any connection to an IPS Meeting. In such cases, the close proximity of some co-workers appeared to prompt grapevine episodes. The following conversation

between co-workers at Integrated Technologies provides an episode of naturally occurring grapevine talk:

Excerpt 3

C: Shawn said he actually saw or heard it this morning when he passed by and they said "wwwwhat what?"

W: Yeah it was on the news Susan heard it too and but now I don't think the West building supplies crystal uh wafers to other plants other than this wafer fab. So even if they- if they do sell. I don't know, usually people just go with that company. Most of them usually do. I don't know. I did hear the rumor. They were talking about the news media being out here last night. Someone had randomly sent a letter to TV stations, radio stations, newspapers. The letters said that within five years this plant would cut back, would lay off two thirds of the employees, and that the wafers ((the product that is built here)) will be obsolete. It would be going out, phased out within the next five years. That, maybe, may have been a vindictive reason to send the letter but we know. .

In excerpt 3, workers who share the same office are engaged in unofficial business talk as they discuss a rumor about the

organization. The workers have not been authorized by the organization to deal with this issue and they know it. As the workers discuss this matter, they are not attempting to solve a problem that they have uncovered. They are only passing organizationally relevant information in an unofficial way. Although grapevine talk and Informal Problem Solving talk are both accomplished in spontaneous, informal ways, they differ in at least this respect: The official business of the organization is conducted in IPS Meetings and not during grapevine episodes.

Some Typical Forms of Problem Solving

At Integrated Technologies, participants in IPS Meetings reflect on and examine information already known to them and collaborate with other workers to incrementally construct unified interpretations about the unknown details of the problem. Because of environmental and other setting specific constraints, such as those imposed by dressing for a clean room and having to re-dress if one leaves it (described earlier), one class of participants (engineers concerned with the production line) is rarely able to witness the actual event or observe details of a problem: These participants must interact with each other to piece together the bits of known facts from such sources as (a) their own background knowledge of the situation, (b) information collected from co-workers, and (c) information stored in the computer documentation system. With information from these sources, workers construct

interpretations about the sources of problems, possible solutions, and ways to implement them.

Participants in IPS Meetings often search for and re-construct the details of a problem that occurred in the past to make sense of current problematic situations. The following segment of conversation provides an example of this type of Informal Problem Solving:

Excerpt 4

C: so could you tell the question that came up in there. We mis-scheduled by two-hundred wafers yesterday.

K: uh huh yeah

C: I couldn't see enough equipment down time that support missing the schedule by two-hundred wafers, Do you? Mean I looked at it

K: well

C: I couldn't- I just couldn't understand why!

K: Do you have that- do you still have that Lonnie?

. . .

C: Now I understand- I understand from seven o'clock on okay?

K: yeah

C: But there's no way that he's was going to move two-hundred wafers from seven o'clock on anyway.

K: Yeah he didn't have any

C: Uh huh. That's was not the reason he mis-scheduled. Now do you think it goes back to

In this problem solving episode, three engineers are meeting in an administrative office to make sense of events that occurred on the previous night shift. They had just received news of the problem in a large formal meeting from a manager and supervisor that the night shift operators had mis-scheduled their required number of lots (i.e., they did not make quota). In this particular IPS Meeting, immediately following the large formal meeting, the engineers try to piece together, step-by-step, the events that caused the operators to miss their quota. They try to re-construct a coherent picture of the problem by using the sources available in the present moment (e.g., pieces of information they can recall, information received in the pass-down meeting, and documentation stored in the computer software). The difficulty they experience in constructing their interpretation is that the information collected from these different sources does not fit their understanding of how the process ordinarily operates.

Other IPS Meetings are occupied with searching for ways to improve work processes or products, such as automating manual processes. This type of problem solving involves generating alternatives and possibilities. The following contemporaneous

description was given to [Author 1] by a statistician while he was sitting with an engineer in a small cubicle office and helping him re-program a computer program:

> We're setting up a track so he can pull data off of our main data base system. So he can do some analysis on it and get some information. So he doesn't have to go out there and physically write down the information and stuff. So ((Integrated Technologies)) can do it automatically for him. The more automated we can work, human error you eliminate. Cuts variation that exists.

Participants in this kind of IPS Meetings are faced with the same limitations as participants who are attempting to re-construct past events. They are unable to directly observe the problem or process to be improved. Because of this, their problem solving also involves constructing interpretations of the situation and generating new alternatives by drawing on their background knowledge, obtaining knowledge from co-workers, and retrieving information stored in the computer. The following segment of conversation (excerpt 5) provides an actual example of projecting alternatives. In this particular episode, a safety technician is projecting into the future about the possibility of requiring maintenance technicians to wear a new safety jumpsuit and face shield.

not fit their understanding of how the process ordinarily operates.

Another example of an IPS Meetings involves the search for ways to improve work processes or products. This kind of Informal Problem Solving does not result from problems that have already occurred, but from a need to make things better such as automating manual processes. In any case, this type of problem solving involves talk to generate alternatives and possibilities for improving organizational matters, not talk aimed at repairing something broken. The following contemporaneous description was given to Mangrum by a statistician while he was sitting with an engineer in a small cubicle office and helping him re-program a computer program:

> We're setting up a track so he can pull data off of our main data base system. So he can do some analysis on it and get some information. So he doesn't have to go out there and physically write down the information and stuff. So ((Integrated Technologies)) can do it automatically for him. The more automated we can work, human error you eliminate. Cuts variation that exists.

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Excerpt 5

S: What if Ben?

B: ah what if

S: What if we went with this as the face shield? Okay and require it because that is a requirement, gotta wear a face shield. And then have this as an option. If it makes you feel better kind of total coverage in lieu of the face shield.

A third type of IPS Meeting involves participants' actively-constructing the unknown details of a current situation. In this "on the spot" problem solving talk, workers may diagnose a problem occurring in the present moment or implement a solution during the present moment. Here, Informal Problem Solving talk is an aspect of ongoing collaborative work. Sometimes it is a formulation of

that ongoing collaborative work as what's happening now, but more often it is simply an aspect (a constituent act within and as) that ongoing collaborative work. It usually involves one worker giving another worker job instructions or two workers trying to discover the correct steps or procedures of a job. The following excerpt provides an example of an engineer and a statistician implementing a decision that has already been made.

Excerpt 6

D: okay

M: you want uh screen screen the lots actually go down one that says screen and lots (like consolidations) and hit E these are the things that you can screen off of uh we want to screen off of lot numbers so select lot number F ten uh we want to select our own lots: right?

D: uh hum

M: so select X then hit F ten

we type in whatever lot numbers we want uh get

In IPS Meetings like this one, participants often experience difficulty in carrying out job instructions. Information about a procedure or method for accomplishing a task does not exist, does not fit, or is unknown to the workers, thereby creating the need to construct an interpretation of the needed information. Workers

often have to rely on co-workers to help them accomplish the task. Although the big picture of how to do the job is known (e.g., automating a production process), the details or the step.by step procedures for doing the task have not been developed or are unknown. Therefore, the participants' in this kind of problem solving meeting also construct interpretations of the situation in collaboration with others and often with the aid of information on a computer screen.

Concluding Remarks

Informal problem solving meetings are openly ad hoc arrangements, happening primarily as immediate responses to current problems wherever and whenever they happen. The called-together ad hoc crew uses the resources at hand, what the participants can recall, what they can learn from each other, what they can retrieve from the computers at hand, and what they can construct with these ingredients to collaboratively fashion a custom-fitted solution. Though it is articulated in no plans put forward by management and occurs on no schedules or tables of organization, workers and management alike understand that engaging in this form of talk at work is indeed to be engaged in the company's labor.

While formal meetings of many sorts exploit the advantages of rationality and foresight, informal problem solving meetings

exploit the advantages and capacities of ordinary conversation. Informal problem solving exploits the finely tuned flexibility of ordinary conversation, especially its utility in correcting errors and misunderstandings, its capacity to be tenaciously kept on track by its participants, and its capacity to mobilize the collaborative contributions of a small number of participants.

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Endnotes

1. "We" discovered a distinctive form of interaction is perhaps misleading. In one rather clear sense, it was over the course of Mangrum's preparatory fieldwork for her dissertation proposal that something emerged in her encounters with workers-at-work in a high tech organization. What emerged was initially formulated in her field notes before she ever reported it to Wieder in conversations aimed at preparing a proposal.

2. Participants in IPS meetings, however, can allude to instances of IPS meetings, especially when a researcher persists in asking about them. Then they are spoken of as "brainstorming," "meeting at a desk," "just having a conversation," "putting our heads together," and, for some IPS, "having a stand-up type meeting." It is also true that some managers insist that the computer has eliminated the necessity for small face-to-face meetings between co-workers and that some of these same managers fail to recognize an IPS Meeting in their proximity, seeing it instead as sociable interaction.

Whereas participants in IPS do not explicitly and directly formulate IPS or its constituents, meetings for problem solving and problem solving activities (as well as their constituents) are directly talked about features of and in more formal planning sessions such as those of the quality circles described here and the naturally occurring use of the nominal group technique in the planning sessions described by Wieder and Hartsell (1996b).

3. The distinction between interaction and gathering, of course, is adapted from Goffman, 1963. The concept is further discussed in point 2, page 7 (Some Primary Features of Informal Problem Solving).

4. A review of the full range of the features that make Informal Problem Solving and Informal Problem Solving Meetings observable would reveal that surveys, experiments, and the purest forms of unmotivated inquiry in canonical conversation analysis are ill equipped to find, identify, and describe IPS and IPS meetings. The notion of "escape" is adapted from the suggestions of Harold Garfinkel, 1992. See also, Garfinkel and Wieder (1992) concerning lived orderlinesses and the rendering theorem.

5. In the attempt to follow APA style and respect the point of the original passage which was not written in APA style, we have slightly altered its marking and punctuation. Square brackets in

the original text enclosing the words "methods for finding it," have a special meaning in the original text. These brackets have been deleted and commas enclosing "as methods" have been added.

6. And, of course, also its natural accountability. Here again we have adapted Garfinkel and Wieder's language (1992, p. 182).

7. The issue here has been rather elaborately developed by Garfinkel in the successive revisions of an unpublished paper titled "A research that succeeded and a research that failed: An introduction for novices," originally given as a guest lecture at Boston University in 1976. Following the logic and language that Garfinkel uses there leads us to say that the practices of Informal Problem Solving provide just what an IPS meeting "looks and sounds like" in and as of its local and interactional production, recognition, and understanding. Just as Garfinkel proposed of the practices composing a queue, it would also be fair to say of an IPSM: "These practices are identical with members' methods. They are identical, too, with "members' knowledge," with "knowing," with "knowing what you are doing," and with "member""(p. 3).

8. Because we have introduced these ideas through the unique adequacy requirement, the competence of the fieldworker with respect to the objects of observation becomes an issue. She was not competent in the specifics of many of the topics of IPS meetings that she attended (often concerning the engineering and production of computer parts). As a first step in the discussion of the methodological constraints of our study (some of which apply to the limitations on the possibility of any serious applied communication), we notice that there were other competent participants in these meetings who also did not have those skills, but did have skills relevant to the problem at hand (e.g. ergonomics, safety, personnel allocation, waste disposal). The limitations of our study are intertwined with the very limitations of a typical IPS Meeting. The state of affairs here is resonant with the criticism and defense of the conversation analysis of situated technical discourse.

9. That is, to place herself or himself in what Garfinkel and Wieder (1992. p. 183) speak of as the "specifically unremarkable presence of" or involvement in the interaction.

10. Ecology in this context concerns relation of a thing to its surroundings including the distribution of that thing in an extended

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surrounding. The ecology of organisms concerns their mutual relationships to each other, to an environment, and their distribution and arrangement with that environment.

11. Computer technology is used in every step of IT's manufacturing operation from conceiving the product to designing, to assembling, to monitoring, to product testing, to packaging, and to distributing the product. A very important part of Integrated Technologies is its computerized documentation system that allows workers to write information about the production process on "travelers," documentation that identifies a particular product from beginning to end. Through the travelers, workers electronically track the production process, communicate instruction (e.g., job specification), and find fault or locate problems. When misprocesses occur, engineers typically go to the documentation system or travelers rather than speak face to face with operators.

In addition to our work at IT, we also did limited observations at a wood products processing firm, a meat processing company, two oil refineries, and interviewing with some workers at an automotive tire production plant,. These industrial settings provided a contrast to Integrated Technologies, because they do not utilize the electronic means of communication to the degree that IT does. They do, however, promote IPS among all types of workers.

12. All on-site data were collected by Mangrum. In collecting this data, we were in contact with Integrated Technologies for forty two months conducting interviews and observing workers to learn about the layout of the plant, the process of manufacturing microchips, and workers' communication patterns. After talking with and sometimes interviewing human resource representatives, statisticians, managers, supervisors, systems analysts, computer programmers, safety technicians, equipment technicians, data specialists, and operators, we observed and tape recorded large formal meetings, small quality circle meetings, administrative workers (e.g., managers, engineers, technicians and other workers) in their offices (and this included tape recorded IPS meetings). We also spent time and talked with operators in clean environments who were working with the actual production process (i.e., manufacturing the microchip).

13. We deliberately mean to allude here to "order" in sense meant in Goffman's title "The interaction order," and also to allude to the idea of orderliness and an orderliness in the writings of Garfinkel and also of Sacks.

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14. There is a long tradition of inventing, advocating, and teaching effective procedures for conducting and participating in discussions within group meetings that is reviewed in Seibold and Krikorian (1997). This interest in the discipline of communication is continuous with an earlier tradition of the art of group discussion and the well run meeting that was an important part of the discipline of speech. Many different kinds of meetings are mentioned in passing in these literatures, but that variety is not thematized as a matter for investigation. For examples of publications on the art of discussion as it was written in the 1950s-1960s, see many of the chapters in Cathcart and Samovar (1970).

15. On-task in just the sense that that term appears in the academic educational research literature and appears in the talk of public school teachers.

16. The language involved in looking at the relationship in terms of one contexting the other owes something to Putnam and Stohl (1990, 1996).

17. Many of these general terms are spelled out by Goffman (1963). What we are calling ecological features are often taken up in the field of nonverbal communication under the titles of proxemics and territoriality.